

The Claims

1. (Previously Presented) A system for offering to a user one or more alternative products similar to a requested product, comprising:

a first user interface operable to receive a user request for a product having one or more product attributes, the user request specifying a desired attribute value for each of one or more selected product attributes;

a search procedure operable to select a set of one or more candidate alternative products having attribute values consistent with the desired attribute values specified in the user request for the selected product attributes, for each potential alternative product in a set of potential alternative products the search procedure operable to:

for each selected product attribute, compare the desired attribute value specified in the user request with the attribute value for the potential alternative product to determine an attribute similarity value for the selected product attribute for the potential alternative product; and

determine a product similarity value for the potential alternative product according to the attribute similarity values, each attribute similarity value having been determined for a selected product attribute for which a desired attribute value is specified in the user request by comparing the desired attribute value specified in the user request with the attribute value for the potential alternative product;

the set of one or more candidate alternative products being selected according to the product similarity values for the potential alternative products, each product similarity value having been determined according to the attribute similarity values determined for each selected product attribute for which a desired attribute value is specified in the user request;

a sort procedure operable to rank the one or more candidate alternative products in order of decreasing similarity to the requested product determined according to the product similarity values for the one or more candidate alternative products, each product similarity value having been determined according to the attribute similarity values determined for each selected product attribute for which a desired attribute value is specified in the user request; and

the user interface operable to present the set of one or more candidate alternative products to the user for selection of a candidate alternative product.

2. (Previously Presented) The system of Claim 1, wherein the first and second user interfaces are combined to function as a single user interface.

3. (Previously Presented) The system of Claim 1, further comprising a database coupled to the search procedure, the database containing information identifying available products, the availability of such products, and the product attributes of such products, the search procedure operable to access the information in the database and, based on the accessed information, to exclude from the set of one or more candidate alternative products all potential alternative products for which no excess supply is available.

4. (Previously Presented) The system of Claim 3, wherein the second user interface, when the user selects a candidate alternative product, is operable to cause the information in the database identifying the availability of the selected candidate alternative product to be updated.

5. (Previously Presented) A method for offering to a user one or more alternative products similar to a requested product, comprising:

receiving from the user a request for a preferred product having one or more product attributes, the user request specifying a desired attribute value for each of one or more selected product attributes;

selecting a set of one or more candidate alternative products having attributes consistent with the desired attribute values specified in the user request for the selected product attributes, for each potential alternative product in a set of potential alternative products the search procedure operable to:

for each selected product attribute, compare the desired attribute value specified in the user request with the attribute value for the potential alternative product to determine an attribute similarity value for the selected product attribute for the potential alternative product; and

determine a product similarity value for the potential alternative product according to the attribute similarity values, each attribute similarity value having been determined for a selected product attribute for which a desired attribute value is specified in the user request by comparing the desired attribute value specified in the user request with the attribute value for the potential alternative product;

the set of one or more candidate alternative products being selected according to the product similarity values for the potential alternative products, each product similarity value having been determined according to the attribute similarity values determined for each selected product attribute for which a desired attribute value is specified in the user request;

rank ordering the one or more candidate alternative products according to their degree of similarity with the preferred product determined according to the product similarity values for the one or more candidate alternative products, each product similarity value having been determined according to the attribute similarity values determined for each selected product attribute for which a desired attribute value is specified in the user request; and

presenting to the user the set of one or more candidate alternative products for selection of a candidate alternative product.

6. (Canceled)

7. (Previously Presented) The system of Claim 1, wherein the desired attribute value for a selected product attribute comprises a maximum, minimum, or exact attribute value for the selected product attribute.

8. (Previously Presented) The system of Claim 1, wherein:
the user request further specifies one or more of a maximum attribute value and a minimum attribute value for each selected product attribute; and
the search procedure is operable to exclude from the set of one or more candidate alternative products all potential alternative products having attribute values that do not satisfy one or more of the maximum attribute value and the minimum attribute value for a corresponding selected product attribute.

9. (Previously Presented) The system of Claim 1, wherein the user request further specifies a desired level of similarity for each of one or more product characteristics, each product characteristic encompassing one or more selected product attributes.

10. (Previously Presented) The system of Claim 9, wherein the specified desired level of similarity for a product characteristic acts as a constraint on the attribute values a potential alternate product may have to become a candidate alternative product.

11. (Previously Presented) The system of Claim 1, wherein the search procedure is operable to determine maximum and minimum attribute values across all potential alternative products for each product attribute for which a desired attribute value is specified.

12. (Previously Presented) The system of Claim 1, wherein each attribute similarity value ASV for a selected product attribute is calculated as follows:

if the attribute value x for the potential alternative product is less than the desired attribute value A_r for the requested product,

$$ASV = \frac{x^2 - A_{\min}^2}{A_r^2 - A_{\min}^2}$$

where A_{\min} is a minimum attribute value for the selected product attribute across all potential alternative products; and

if the attribute value x for the potential alternative product is greater than the desired attribute value A_r for the requested product,

$$ASV = \frac{x^2 - A_{\max}^2}{A_r^2 - A_{\max}^2}$$

where A_{\max} is a maximum attribute value for the selected product attribute across all potential alternative products.

13. (Previously Presented) The system of Claim 1, wherein if a selected product attribute is a binary attribute, then the attribute similarity value for a potential alternative product is zero if the attribute value for the potential alternative product is not the same as the desired attribute value for the requested product and is one if the attribute value for the potential alternative product is the same as the desired attribute value for the requested product.

14. (Previously Presented) The system of Claim 1, wherein:

the user request further specifies an attribute weight for each selected product attribute; and

the search procedure is operable to:

determine a weighted sum of the attribute similarity values for the selected product attributes for the potential alternative product according to the attribute weights for the selected product attributes; and

determine the product similarity value for the potential alternative product according to the weighted sum of the attribute similarity values.

15. (Previously Presented) The system of Claim 1, wherein the product similarity value for a potential alternative product comprises a global index value for the potential alternative product with respect to the requested product.

16. (Previously Presented) The system of Claim 1, wherein:
the user request further specifies a threshold product similarity value; and
the search procedure is operable to compare the product similarity value for each potential alternative product with the threshold product similarity value and to exclude from the set of one or more candidate alternative products each potential alternative product having a product similarity value that does not satisfy the threshold product similarity value.

17. (Previously Presented) The system of Claim 1, wherein the sort procedure is operable to limit the ranked candidate alternative products to a user-specified number.

18. (Previously Presented) The system of Claim 1, wherein:
the user request further specifies an attribute weight for each selected product attribute; and

the sort procedure is operable to:

if two candidate alternative products are tied in that they have the same product similarity values, ranking the two candidate alternative products in order of decreasing attribute similarity value for the selected product attribute having the highest attribute weight;

if the two candidate alternative products are still tied in that they have the same attribute similarity value for the selected product attribute having the highest attribute weight, ranking the two candidate alternative products in order of decreasing attribute similarity value for the selected product attribute having the second highest attribute weight;
and

if necessary to break the tie, continuing with respect to one or more successive selected product attributes having lower attribute weights until the tie is broken.

19. (Previously Presented) The method of Claim 5, further comprising:
accessing information identifying available products, the availability of such products, and the product attributes of such products; and
based on the accessed information, excluding from the set of one or more candidate alternative products all potential alternative products for which no excess supply is available.
20. (Previously Presented) The method of Claim 19, further comprising, in response to user selection of a candidate alternative product, causing the identifying the availability of the selected candidate alternative product to be updated.
21. (Previously Presented) The method of Claim 5, wherein the desired attribute value for a selected product attribute comprises a maximum, minimum, or exact attribute value for the selected product attribute.
22. (Previously Presented) The method of Claim 5, wherein:
the user request further specifies one or more of a maximum attribute value and a minimum attribute value for each selected product attribute; and
selecting the set of one or more candidate alternative products comprises excluding from the set of one or more candidate alternative products all potential alternative products having attribute values that do not satisfy one or more of the maximum attribute value and the minimum attribute value for a corresponding selected product attribute.
23. (Previously Presented) The method of Claim 5, wherein the user request further specifies a desired level of similarity for each of one or more product characteristics, each product characteristic encompassing one or more selected product attributes.
24. (Previously Presented) The method of Claim 23, wherein the specified desired level of similarity for a product characteristic acts as a constraint on the attribute values a potential alternate product may have to become a candidate alternative product.

25. (Previously Presented) The method of Claim 5, further comprising determining maximum and minimum attribute values across all potential alternative products for each product attribute for which a desired attribute value is specified.

26. (Previously Presented) The method of Claim 5, wherein each attribute similarity value ASV for a selected product attribute is calculated as follows:

if the attribute value x for the potential alternative product is less than the desired attribute value A_r for the requested product,

$$ASV = \frac{x^2 - A_{min}^2}{A_r^2 - A_{min}^2}$$

where A_{min} is a minimum attribute value for the selected product attribute across all potential alternative products; and

if the attribute value x for the potential alternative product is greater than the desired attribute value A_r for the requested product,

$$ASV = \frac{x^2 - A_{max}^2}{A_r^2 - A_{max}^2}$$

where A_{max} is a maximum attribute value for the selected product attribute across all potential alternative products.

27. (Previously Presented) The method of Claim 5, wherein if a selected product attribute is a binary attribute, then the attribute similarity value for a potential alternative product is zero if the attribute value for the potential alternative product is not the same as the desired attribute value for the requested product and is one if the attribute value for the potential alternative product is the same as the desired attribute value for the requested product.

28. (Previously Presented) The method of Claim 5, wherein:
the user request further specifies an attribute weight for each selected product attribute; and
selecting the set of one or more candidate alternative products comprises:
determining a weighted sum of the attribute similarity values for the selected product attributes for the potential alternative product according to the attribute weights for the selected product attributes; and
determining the product similarity value for the potential alternative product according to the weighted sum of the attribute similarity values.
29. (Previously Presented) The method of Claim 5, wherein the product similarity value for a potential alternative product comprises a global index value for the potential alternative product with respect to the requested product.
30. (Previously Presented) The method of Claim 5, wherein:
the user request further specifies a threshold product similarity value; and
selecting the set of one or more candidate alternative products comprises comparing the product similarity value for each candidate alternative product with the threshold product similarity value and excluding from the set of one or more candidate alternative products each candidate alternative product having a product similarity value that does not satisfy the threshold product similarity value.
31. (Previously Presented) The method of Claim 5, further comprising limiting the ranked candidate alternative products to a user-specified number.

32. (Previously Presented) The method of Claim 5, wherein:

the user request further specifies an attribute weight for each selected product attribute; and

rank ordering the one or more candidate alternative products comprises:

if two candidate alternative products are tied in that they have the same product similarity values, ranking the two candidate alternative products in order of decreasing attribute similarity value for the selected product attribute having the highest attribute weight;

if the two candidate alternative products are still tied in that they have the same attribute similarity value for the selected product attribute having the highest attribute weight, ranking the two candidate alternative products in order of decreasing attribute similarity value for the selected product attribute having the second highest attribute weight; and

if necessary to break the tie, continuing with respect to one or more successive selected product attributes having lower attribute weights until the tie is broken.

33. (Previously Presented) Software for offering to a user one or more alternative products similar to a requested product, the software embodied in computer-readable media and when executed operable to:

receive from the user a request for a preferred product having one or more product attributes, the user request specifying a desired attribute value for each of one or more selected product attributes;

select a set of one or more candidate alternative products having attributes consistent with the desired attribute values specified in the user request for the selected product attributes, for each potential alternative product in a set of potential alternative products the search procedure operable to:

for each selected product attribute, compare the desired attribute value specified in the user request with the attribute value for the potential alternative product to determine an attribute similarity value for the selected product attribute for the potential alternative product; and

determine a product similarity value for the potential alternative product according to the attribute similarity values, each attribute similarity value having been determined for a selected product attribute for which a desired attribute value is specified in the user request by comparing the desired attribute value specified in the user request with the attribute value for the potential alternative product;

the set of one or more candidate alternative products being selected according to the product similarity values for the potential alternative products, each product similarity value having been determined according to the attribute similarity values determined for each selected product attribute for which a desired attribute value is specified in the user request;

rank order the one or more candidate alternative products according to their degree of similarity with the preferred product determined according to the product similarity values for the one or more candidate alternative products, each product similarity value having been determined according to the attribute similarity values determined for each selected product attribute for which a desired attribute value is specified in the user request; and

present to the user the set of one or more candidate alternative products for selection of a candidate alternative product.

34. (Previously Presented) The software of Claim 33, further operable to:
access information identifying available products, the availability of such products,
and the product attributes of such products; and
based on the accessed information, exclude from the set of one or more candidate
alternative products all potential alternative products for which no excess supply is available.

35. (Previously Presented) The software of Claim 34, further operable to, in
response to user selection of a candidate alternative product, cause the identifying the
availability of the selected candidate alternative product to be updated.

36. (Previously Presented) The software of Claim 33, wherein the desired
attribute value for a selected product attribute comprises a maximum, minimum, or exact
attribute value for the selected product attribute.

37. (Previously Presented) The software of Claim 33, wherein:
the user request further specifies one or more of a maximum attribute value and a
minimum attribute value for each selected product attribute; and
selecting the set of one or more candidate alternative products comprises excluding
from the set of one or more candidate alternative products all potential alternative products
having attribute values that do not satisfy one or more of the maximum attribute value and the
minimum attribute value for a corresponding selected product attribute.

38. (Previously Presented) The software of Claim 33, wherein the user request
further specifies a desired level of similarity for each of one or more product characteristics,
each product characteristic encompassing one or more selected product attributes.

39. (Previously Presented) The software of Claim 38, wherein the specified
desired level of similarity for a product characteristic acts as a constraint on the attribute
values a potential alternate product may have to become a candidate alternative product.

40. (Previously Presented) The software of Claim 33, further operable to determine maximum and minimum attribute values across all potential alternative products for each product attribute for which a desired attribute value is specified.

41. (Previously Presented) The software of Claim 33, wherein each attribute similarity value ASV for a selected product attribute is calculated as follows:

if the attribute value x for the potential alternative product is less than the desired attribute value A_r for the requested product,

$$ASV = \frac{x^2 - A_{\min}^2}{A_r^2 - A_{\min}^2}$$

where A_{\min} is a minimum attribute value for the selected product attribute across all potential alternative products; and

if the attribute value x for the potential alternative product is greater than the desired attribute value A_r for the requested product,

$$ASV = \frac{x^2 - A_{\max}^2}{A_r^2 - A_{\max}^2}$$

where A_{\max} is a maximum attribute value for the selected product attribute across all potential alternative products.

42. (Previously Presented) The software of Claim 33, wherein if a selected product attribute is a binary attribute, then the attribute similarity value for a potential alternative product is zero if the attribute value for the potential alternative product is not the same as the desired attribute value for the requested product and is one if the attribute value for the potential alternative product is the same as the desired attribute value for the requested product.

43. (Previously Presented) The software of Claim 33, wherein:
the user request further specifies an attribute weight for each selected product attribute; and
selecting the set of one or more candidate alternative products comprises:
determining a weighted sum of the attribute similarity values for the selected product attributes for the potential alternative product according to the attribute weights for the selected product attributes; and
determining the product similarity value for the potential alternative product according to the weighted sum of the attribute similarity values.
44. (Previously Presented) The software of Claim 33, wherein the product similarity value for a potential alternative product comprises a global index value for the potential alternative product with respect to the requested product.
45. (Previously Presented) The software of Claim 33, wherein:
the user request further specifies a threshold product similarity value; and
selecting the set of one or more candidate alternative products comprises comparing the product similarity value for each candidate alternative product with the threshold product similarity value and excluding from the set of one or more candidate alternative products each candidate alternative product having a product similarity value that does not satisfy the threshold product similarity value.
46. (Previously Presented) The software of Claim 33, further operable to limit the ranked candidate alternative products to a user-specified number.

47. (Previously Presented) The software of Claim 33, wherein:
- the user request further specifies an attribute weight for each selected product attribute; and
 - rank ordering the one or more candidate alternative products comprises:
 - if two candidate alternative products are tied in that they have the same product similarity values, ranking the two candidate alternative products in order of decreasing attribute similarity value for the selected product attribute having the highest attribute weight;
 - if the two candidate alternative products are still tied in that they have the same attribute similarity value for the selected product attribute having the highest attribute weight, ranking the two candidate alternative products in order of decreasing attribute similarity value for the selected product attribute having the second highest attribute weight; and
 - if necessary to break the tie, continuing with respect to one or more successive selected product attributes having lower attribute weights until the tie is broken.

48. (Previously Presented) A system for offering to a user one or more alternative products similar to a requested product, comprising:

a user interface operable to receive a user request for a product having one or more product attributes, the user request specifying:

a desired attribute value each of one or more selected product attributes;

an attribute weight for each selected product attribute; and

a threshold product similarity value;

a search procedure operable to select a set of one or more candidate alternative products having attribute values consistent with the desired attribute values specified in the user request for the selected product attributes, for each potential alternative product in a set of potential alternative products the search procedure operable to:

for each selected product attribute, compare the desired attribute value specified in the user request with the attribute value for the potential alternative product to determine an attribute similarity index value for the selected product attribute for the potential alternative product;

determine a weighted sum of the attribute similarity index values for the selected product attributes for the potential alternative product according to the attribute weights for the selected product attributes; and

determine a product similarity index value for the potential alternative product according to the weighted sum of the attribute similarity index values, each attribute similarity index value having been determined for a selected product attribute for which a desired attribute value is specified in the user request by comparing the desired attribute value specified in the user request with the attribute value for the potential alternative product;

compare the product similarity index value for the potential alternative product with the threshold product similarity value and to include the potential alternative product in the set of one or more candidate alternative products if the potential alternative product has a product similarity index value that satisfies the threshold product similarity value, each product similarity index value having been determined according to the weighted sum of the attribute similarity index values determined for each selected product attribute for which a desired attribute value is specified in the user request;

a sort procedure operable to rank the one or more candidate alternative products in order of decreasing similarity to the requested product determined according to the product similarity index values for the one or more candidate alternative products, each product similarity index value having been determined according to the weighted sum of the attribute similarity index values determined for each selected product attribute for which a desired attribute value is specified in the user request; and

the user interface operable to present the set of one or more candidate alternative products to the user for selection of a candidate alternative product.